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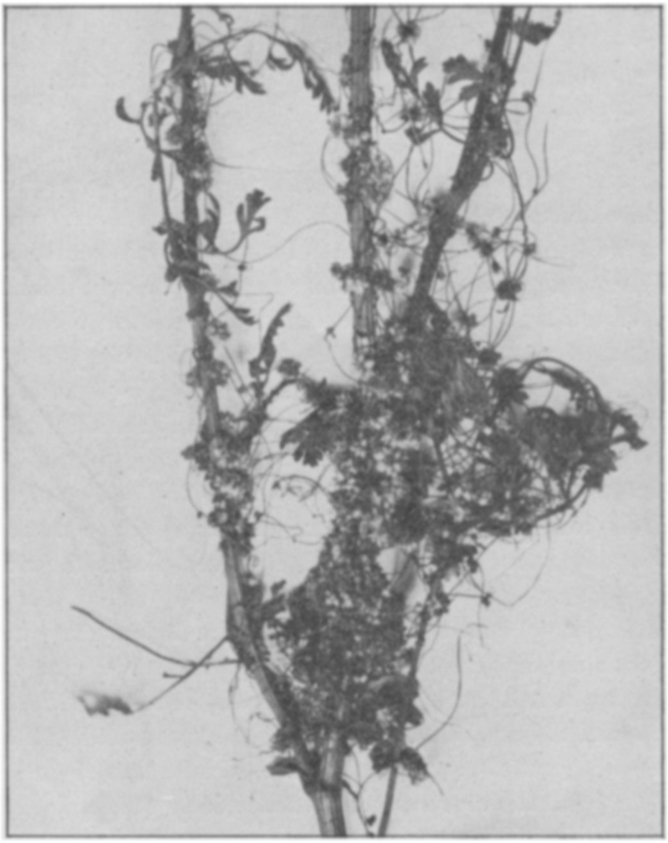
Two Phaenogamous Parasites of the Red Clover.

BY BYRON D. HALSTED.

The season of 1897 was remarkable in New Jersey for the unusual development of dodder (*Cuscuta Epithymum* Murr.), upon the red clover (*Trifolium pratense* L.). Extracts from two of the many letters that were received concerning this parasite will indicate the extent of the trouble. "While cutting the clover the machine would suddenly enter a thread-like mass, which clogged it completely. * * * The wilted mass formed a sort of blanket which could be rolled up. * * * There were about fifteen of these beds averaging six feet in diameter to the acre. * * * In these beds everything is as dead as if burned over with fire." From another letter it is gathered that the dodder formed "A dense mat almost obscuring the clover stems. * * * In some places the clover is killed."

These extracts indicate how active the dodder may become when once it gains a foothold in the clover field. One field of over ten acres not more than three miles from the Experiment Station was left uncut, because so completely overrun by the dodder, and suggests that the seed of the parasite was sown as foul stuff along with the clover seed. While nearly the same shape as the clover, the dodder seed is not more than one fourth as broad or long and should be easily separated by an ordinary fanning mill with properly adjusted sieves. It is not unlikely that, when the dodder is once upon a farm, it gets distributed in the manure.

This species of dodder is one of the most delicate and beautiful of the genus, the slender stems being almost hair-like in their fineness and the flowers taking on in some cases a rose pink as delicate as that of the trailing arbutus. The extreme attractiveness of the charming tint of the small clusters of tiny blossoms is brought out as met with upon the stems and leaves of the common wild carrot (*Daucus Carota* L.). The accompanying engraving shows the infested wild carrot plant, and emphasizes the fact that the species is not confined to the clovers. It sometimes grows upon



the timothy grass when associated, as it frequently is, with the clover in the meadow.

In looking over a large number of state and local floras this dodder is mentioned in but two. Beal and Wheeler's "Michigan Flora," 1892, page 117, states "introduced at Salem with alfalfa seed." It is listed in Millspaugh's "Flora of W. Virginia," page 223, and also in his "Preliminary Catalogue." The same author in his "Illustrated Descriptive List of Weeds" figures the clover dodder and states that "only one report of this dreaded parasite so detrimental to clover fields has come to me in this State; that from Greenbrier county where it was probably imported in clover seed from England."

The dodder is given a plate in the report of the Botanist of the United States Department of Agriculture for 1890 and is mentioned as prevalent in Missouri.

These notes only increase the value of a record of the outbreak that was experienced by the farmers in New Jersey in 1897.

The second flower-bearing clover parasite is the broom-rape (*Orobanche minor* J. E. S.). Mr. L. S. Davis, a college student from Cumberland county, brought me specimens of this plant which he found growing in some abundance upon the red clover in the southern part of the State near Shiloh.

While a somewhat familiar plant in the Old World this clover parasite is rarely met with in the United States. After an examination of a long list of state and local floras the writer fails to find it listed outside of New Jersey, except in Ward's Guide to the Flora of Washington and Vicinity and Holm's Additions to Flora of Washington in which it is recorded that Prof. E. S. Burgess found it at Mount Vernon Square. Gray's Flora of North America gives New Jersey to Virginia as its range and states that it is "sparingly and probably recently introduced."

It was taken by Mr. Clute at Tom's River, N. J. in the summer of 1883 and by Mrs. W. McGeorge at Woodbury, the date not being recorded with the specimens that are in the herbarium.

In Britton's Flora of New Jersey mention is made of three other localities in the State where the broom-rape has been taken.

From all that is learned the Shiloh region is the only one where the parasite has become so abundant in the United States as to attract attention and prove destructive to the clover. If the *Orobanche minor* is more widely distributed than the above note would suggest the writer would be pleased to learn of its range.

It is also remarked that the broom-rape made its presence felt in the same year when the dodder of the same host was most abundant for a long time. The peculiarities of an excessively wet July when the rainfall was 11.42 inches and more than double the average amount, may have had something to do with the outbreak in case of both of the phaenogamous parasites.

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